

THAT WHICH IS CLAIMED IS:

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✓ A heating device for controllably heating an article, the heating device defining a processing chamber to hold the article and comprising:

- a housing including:
  - a susceptor portion surrounding at least a portion of the processing chamber; and
  - a conductor portion interposed between the susceptor portion and the processing chamber; and
- an EMF generator operable to induce eddy currents within the susceptor portion such that substantially no eddy currents are induced in the conductor portion;
- wherein the conductor portion is operative to conduct heat from the susceptor portion to the processing chamber.

2. The heating device of Claim 1 wherein at least 90% of the power from the EMF generator absorbed by the housing is attenuated by the susceptor portion.

3. The heating device of Claim 1 wherein the susceptor portion includes a susceptor core of a first material and a susceptor coating of a second material.

4. The heating device of Claim 3 wherein the first material is graphite.

5. The heating device of Claim 3 wherein the second material is SiC.

6. The heating device of Claim 3 wherein the second material is selected from the group consisting of refractory metal carbides.

7. The heating device of Claim 6 wherein the second material is TaC.

8. The heating device of Claim 1 wherein substantially all surfaces of the conductor portion in fluid communication with the processing chamber are formed of SiC.

9. The heating device of Claim 8 wherein the conductor portion includes a conductor core of a first material and a conductor coating of a second material different from the first material.

10. The heating device of Claim 9 wherein the first material is graphite.

11. The heating device of Claim 9 wherein the second material is a refractory metal carbide.

12. The heating device of Claim 9 wherein the second material is SiC.

13. The heating device of Claim 1 wherein:

a) the susceptor portion includes a first susceptor portion and a second susceptor portion disposed on opposed sides of the processing chamber;

b) the conductor portion includes a first liner disposed between the first susceptor portion and the processing chamber and a second liner disposed between the second susceptor portion and the processing chamber.

14. The heating device of Claim 13 wherein the second susceptor portion includes a platter region, the heating device further including:

a platter adapted to support the article disposed in the processing chamber and overlying the platter region; and

an opening defined in the second liner and overlying the platter region and interposed between the platter region and the platter.

15. The heating device of Claim 14 wherein the second liner includes first and second liner members disposed on opposed sides of the platter and each

defining a portion of the opening, wherein the first and second liner members are separable.

16. The heating device of Claim 15 wherein at least one of the first and second liner members is separable from the second susceptor portion.

17. The heating device of Claim 1 including a platter adapted to support the article disposed in the processing chamber.

18. The heating device of Claim 17 wherein the EMF generator is operable to generate the electromagnetic field such that:

the electromagnetic field does not induce substantial eddy currents in the platter; and

the platter conducts heat from the susceptor portion to the processing chamber.

19. The heating device of Claim 17 including an opening defined in the conductor portion, wherein the opening is interposed between the susceptor portion and the platter.

20. The heating device of Claim 17 wherein the platter is adapted to rotate relative to the susceptor portion.

21. The heating device of Claim 1 including an inlet opening and an outlet opening in fluid communication with the processing chamber.

22. The heating device of Claim 21 including a supply of processing gas reactive to heat to deposit SiC.

23. The heating device of Claim 1 wherein the EMF generator is operable to heat the susceptor portion to a temperature of at least 1400°C.

24. A housing assembly for an induction heating device, the housing assembly defining a processing chamber and comprising:

- a) a susceptor surrounding at least a portion of the processing chamber; and
- b) a thermally conductive liner interposed between the susceptor and the processing chamber, wherein the liner is separately formed from the susceptor.

25. The housing assembly of Claim 24 including:

- a first susceptor portion and a second susceptor portion disposed on opposed sides of the processing chamber;
- a first liner disposed between the first susceptor portion and the processing chamber; and
- a second liner disposed between the second susceptor portion and the processing chamber.

26. The housing assembly of Claim 24 wherein the susceptor includes a platter region, the housing assembly further including:

- a platter adapted to support the article disposed in the processing chamber and overlying the platter region; and
- an opening defined in the liner and interposed between the platter region and the platter.

27. The housing assembly of Claim 26 wherein the liner includes first and second liner members disposed on opposed sides of the platter and each defining a portion of the opening, wherein the first and second liner members are separable.

28. The housing assembly of Claim 27 wherein at least one of the first and second liner members is separable from the susceptor.

29. The housing assembly of Claim 24 including means for positively and removably locating the liner relative to the susceptor.

30. The housing assembly of Claim 24 wherein the liner varies in thickness along at least a portion of its length.

31. A method for controllably heating an article, the method comprising:

- a) positioning the article in a processing chamber;
- b) applying an electromagnetic field to a housing about the processing chamber such that eddy currents are induced within an outer, susceptor portion of the housing and such that substantially no eddy currents are induced in an inner, conductor portion of the housing; and
- c) conducting heat from the susceptor portion to the processing chamber through the conductor portion.

32. The method of Claim 31 wherein at least 90% of the power of the electromagnetic field absorbed by the housing is attenuated by the susceptor portion.

33. The method of Claim 31 including passing a flow of processing gas through the processing chamber adjacent the article.

34. The method of Claim 33 wherein the step of passing the flow of processing gas includes passing the flow of processing gas through the processing chamber at a rate of at least 20 slpm.

35. The method of Claim 33 wherein the processing gas includes a compound selected from the group consisting of SiH<sub>4</sub> and C<sub>3</sub>H<sub>8</sub>.

36. The method of Claim 31 wherein the article is a substrate of semiconductor material.

37. The method of Claim 36 wherein the article is a substrate of SiC.

38. The method of Claim 31 including depositing an epitaxial layer on the article while the article is heated by the thermal energy conducted from the susceptor portion to the processing chamber by the conductor portion.

39. The method of Claim 31 wherein the susceptor portion includes a platter region, and the conductor portion defines an opening therein, said method further including:

positioning a platter in the processing chamber such that the opening is interposed between the platter region and the platter; and  
placing the article on the platter.

40. The method of Claim 39 wherein the conductor portion includes first and second liner portions defining the opening therebetween, said method further including:

removing the first liner portion from the processing chamber; and thereafter, removing the platter from the processing chamber.

41. The method of Claim 31 including placing the article on a platter and rotating the platter and the article relative to the susceptor.

42. The method of Claim 31 including removing the conductor portion from the susceptor portion.